

### **Abstract of the Disclosure**

A modified alkali silicate composition for forming an inorganic polymer matrix having improved mechanical properties. The modified alkali silicate matrix is made by  
5 reacting an alkali silicate (or its precursors such as an alkali hydroxide, a  $\text{SiO}_2$  source and water), a non-silicate network former and/or reactive glass, water and optionally one or more multivalent cation(s) selected from Groups 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16 of the periodic table such as an alkaline earth salt, water and optional processing aids. An inorganic matrix composite can be prepared by applying a slurry of the modified  
10 aqueous alkali silicate composition to a reinforcing medium and curing the composite at a temperature from about  $15^\circ\text{C}$  up to  $1000^\circ\text{C}$  and a pressure of up to 20,000 psi for typical high-performance organic polymer processing (temperatures about  $15^\circ\text{C}$  to about  $200^\circ\text{C}$  and pressures  $<200$  psi). The composite can be shaped by compression molding as well as other known fabrication methods.

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